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8949SVM-LOC/-UMD
HD/SD SDI SINGLE VIEWING MODULES

Instruction Manual

SOFTWARE VERSION 1.0

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Including its implementation, meets the requirements of the standard:

ISO 9001:2000

Scope:
The design, manufacture and support of video hardware and software products and related systems.

This Certificate is valid until: June 14, 2009
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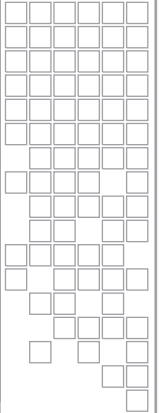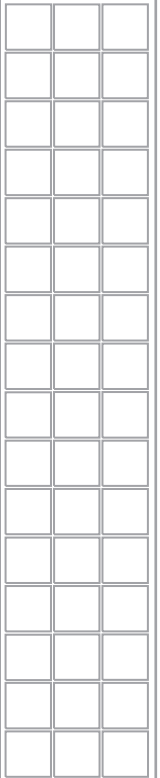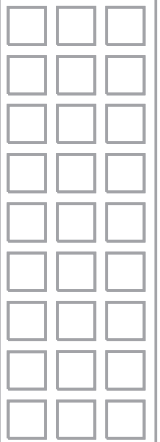ACCREDITED

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Product Type

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Preface

About This Manual

This manual describes the features of the 8949SVM-LOC and 8949SVM-UMD modules as part of the GeckoFlex Signal Processing System family. As part of this module family, it is subject to Safety and Regulatory Compliance described in the *GeckoFlex Frames 8900FX/FF/FFN Signal Processing System Instruction Manual.*

All Modular product manuals can be found on-line in PDF format at this link:

www.thomsongrassvalley.com/docs/modular

8949SVM-LOC and 8949SVM-UMD Single Viewing Modules

Introduction

The 8949SVM-LOC and 8949SVM-UMD Single Viewing modules display HD-SDI and SD-SDI signals on flat-panel monitors such as video or computer TFT displays. The output of the modules is via a DVI-I type connector type and can be used to feed DVI monitors as well as analog VGA style units. Both 8949SVM models support a wide range of monitor resolutions and refresh rates. The input is auto-sensing for HD and SD. The output is auto-sensing for monitor resolution and scan rate. These auto-sensing features provide the convenience of installation without user configuration.

The 8949SVM modules includes a de-embed capacity to provide analog audio feeds on balanced connectors for easy stereo audio monitoring. Uniquely the 8949SVM will both scale and frame-rate convert to drive the monitor at its native resolution and frame rate. This ensures high-quality, consistent image processing on a wide variety of screen types.

The 8949SVM-UMD has the added features of UMD text and tally functions that can be driven from a central controller via the module's own Ethernet connection.

Both 8949SVM models consist of a front and rear module set that uses a single slot of a GeckoFlex frame. This model uses local on-board controls for all setup procedures.

Module Features

The 8949SVM has the following key features:

- Monitor HD or SD-SDI video on flat panel monitors,
- Drive video or low-cost computer monitors with DVI-I or VGA inputs,
- Balanced analog audio monitoring outputs,
- Audio delay compensation for both module and monitor processing,

- Auto sensing of monitor resolution and scan rate via EDID,

- Temporal conversion to display video on non-video (PC) monitors,

- Built-in display compensation for color and black stretch,

- Patterns for monitor setup including Pluge,

- Frame lock modes to ensure no skipped or repeated frames, and

- Support of aspect ratio conversion to suit 16:9, 16:10, 4:3, and 5:4 monitor screen sizes when fed with 16:9, 4:3, or 16:9 anamorphic picture sizes.

Applications

Common applications for using the 8949SVM modules include:

- Monitoring video on flat-panel displays,

- Using low cost display types for viewing HD-SDI signals, and

- Creating a complete monitor station with high-resolution viewing and stereo audio.

Module Placement in the GeckoFlex Frame

The 8949SVM-LOC model consists of a two module set including an 8949SVM-LOC-F front module and an 8900AVM-R rear module.

The 8949SVM-UMD model consists of a two module set including an 8949SVM-UMD-F front module and an 8900AVM-R rear module.

System requirements for this model include the following:

- The 8949SVM-LOC/-UMD must be installed in a GeckoFlex frame with a front cover with fans (8900FF or 8900FFN).

- The module does not communicate with the 8900NET (Net Card) over the frame serial bus. See *Module Configuration and Monitoring* on page 18.

- Module configuration is performed using the two paddle switch controls on the front edge of the module. Refer to *Configuration with Paddle Switch Controls* on page 19.

There are ten rear and front slot locations in a GeckoFlex frame to accommodate all types of 8900 video or audio modules. The front module can be plugged into any one of the GeckoFlex frame front slots. The companion rear module plugs into the corresponding rear slot. The rear module should always be installed first.

Note   As the module can be installed or removed when the GeckoFlex frame is powered up, before removing the cover, please put an anti-static bracelet or heel straps tied to a metal part of the frame.

Module Installation Precautions

Please read and follow the precautions listed below before installing the front and rear modules:

- Use standard anti-static procedures during installation. As modules can be installed or removed when the GeckoFlex frame is powered up, before removing the cover, please use an anti-static bracelet or heel straps tied to a metal part of the frame.

- Install the rear module first, then the front module.

- When installing or removing a rear module, loosen or tighten the screws holding the retainer clips to the frame manually with the retainer clip tool provided inside the front cover of the frame or use a 2 mm (5/64") hex screwdriver. Please do not use an electric screwdriver.

Note   On newer 751- version GeckoFlex frames, a Rear Retainer Clip removal tool and 2 extra retainer clips and screws for installing them are provided on the inside of the frame cover.

- Make every effort to leave the screws holding the retainer clips in place (do not remove them completely). They are very small and can easily drop into other equipment causing a shorting hazard. (Two turns of the screw should be enough to loosen the screws, 3 turns or more will remove it.)

- When installing a rear module, tighten the screws on the retainer clips just until snug. Do not apply more force than is necessary to seat the rear module.

Rear Module Installation

Refer to Figure 1 for the rear module installation.

1. Loosen (but do not remove completely) the two screws holding each retainer clip to the frame with a 2 mm (5/64″) hex screwdriver. Pull up on the retainer clip to remove it, leaving the screws in place.

CAUTION   Be careful to leave the screws in place as they can be easily lost or fall into equipment below the frame creating a shorting hazard.

2. Remove the blank rear adapter cover slot by inserting needlenose pliers into the slots in the top and bottom of the blank and pulling it off.

Note   To remove a rear module already installed, follow the same steps. It is helpful to first remove the front module so the rear can be pulled out more easily.

3. Insert the rear module into the empty slot.

4. Replace each retainer clip over the two screws on both sides of the module and push down to seat the retainer.

5. Tighten the screws for each retainer clip just until they are snug. Do not force or torque the screws too tightly.

Figure 1. Installing Rear Module

Use needlenose pliers to pull out blank after removing retainers.
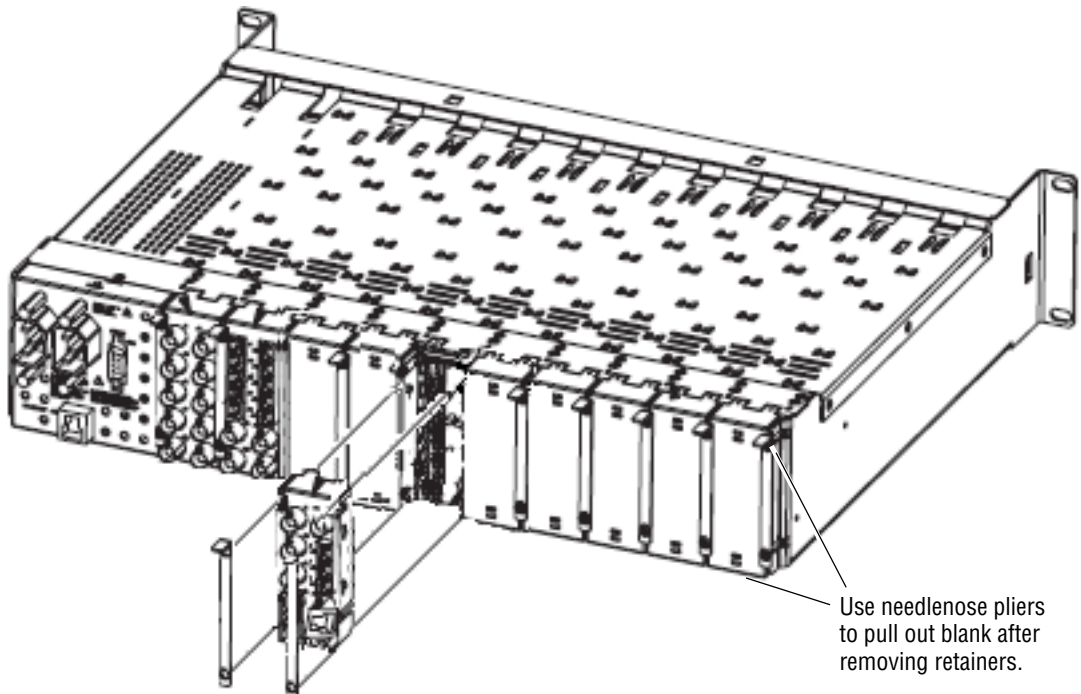
Front Module Installation

After installing the rear module, install the front module as follows:

1. Remove the front cover of the frame if required.

2. Locate the corresponding front slot.

3. Insert the front module so that the plastic card guides on the module top and bottom edges go over the upper and lower raised rail guides on the right of the top and bottom of the slot (Figure 2).

4. Carefully slide the module into the rear connector on the rear module.

5. Lock the front module ejector tab into the locking pin.

CAUTION   This module must be installed in a GeckoFlex frame with front cover fans (8900FF/FFN). Keep the front cover on the frame at all times after installation and configuration to insure proper cooling.
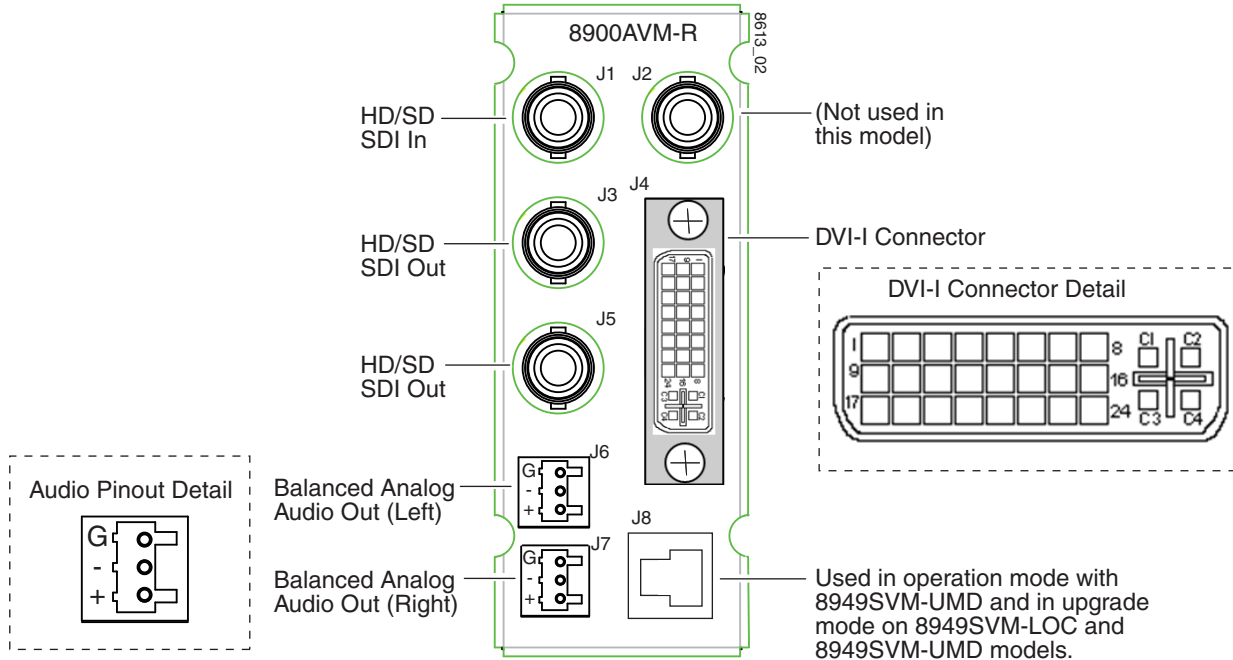
Figure 2. Front Module Installation
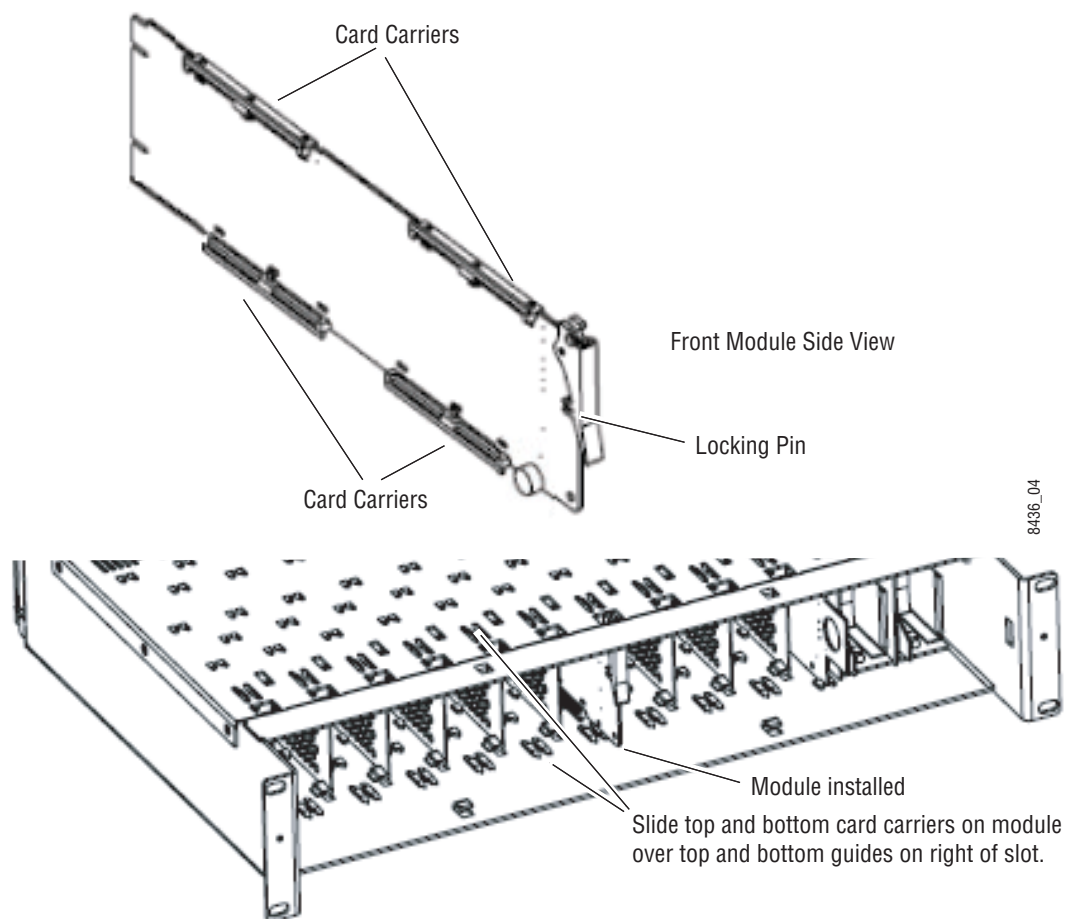
Cabling

Cabling to either model version of the 8949SVM module is done on the connectors on the 8900AVM-R rear module as shown in Figure 3 and described below.

Figure 3. 8900AVM -R Rear Cabling

Video HD/SD Input

The module has one input BNC that accepts an HD or SD SDI video signal at BNC J1. The input is auto-sensing. Video standards accepted by the module are listed in Table 2 on page 33.

Video HD/SD Outputs

There are two looping HD/SD SDI video outputs on BNCs J3 and J5. Outputs follow the video input.

DVI-I Connector

A DVI-I connector at J4 outputs the scaled video input to the external monitor. The DVI-I connector is detailed on the right of Figure 3. This connector accepts a DVI-I cable or cable adapter if using a VGA monitor. Supported output resolutions are listed in Table 2 on page 33.

Using a VGA Monitor

You may connect the 8949SVM module to an analog VGA monitor by using a DVI to VGA adapter (customer-supplied) to connect the VGA cable to the DVI connector, J4, on the 8949SVM rear module. An example of a typical adapter is shown in Figure 4. Information for ordering cable adapters is available on-line.

Figure 4. DVI to VGA Adapter

Connect to DVI-I connector, J4, on 8900AVM-R rear module
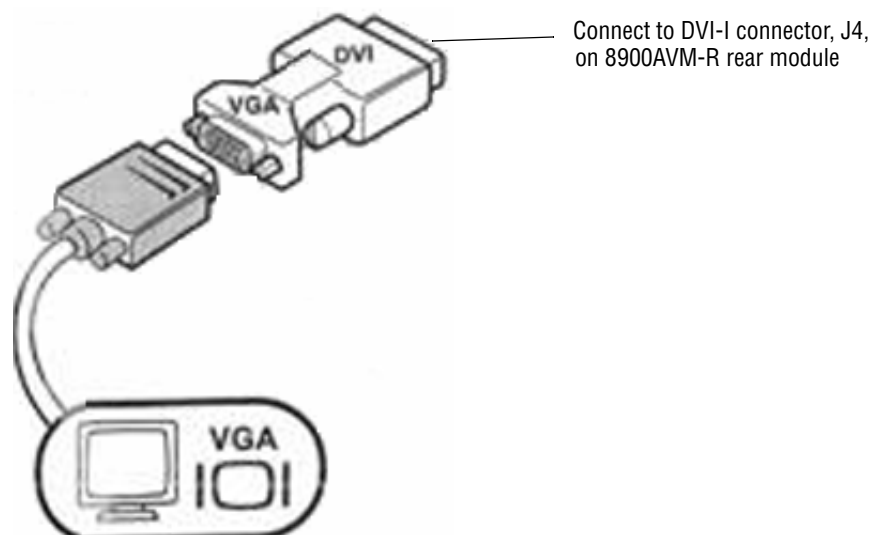
After connecting the 8949SVM to your VGA monitor, you will need to change the Display Drive mode from DVI to RGB following the instructions given below under *Monitor Display Selection*.

Monitor Display Selection

Note   This change must be made while holding down the **Menu** paddle switch control and inserting the module into a powered up frame.

Before inserting the module into the powered up frame, press and hold down the **Menu** paddle switch control on the front edge of the module (Figure 8 on page 19). Continue to hold the **Menu** paddle switch control down while inserting the module until it is seated in the rear module connector and the monitor senses an input. This will take about 10 seconds. When the **Menu** paddle switch control is held down for longer, the unit will cycle between DVI and RGB every 5 seconds. Leave the setting on RGB. It is not necessary to connect an SDI input during this process.

Balanced Analog Audio Outputs

Two balanced analog audio outputs are provided at connectors J6 (right) and J7 (left). An audio pinout detail is shown in Figure 3 on page 14.

One audio pair from embedded audio pairs 1-4 in the input signal can be selected to be output using the front paddle switch controls. Refer to the Audio Setup control group in Table 1 on page 20.

Ethernet Port

The 8949SVM-UMD uses the Ethernet port connection at J8 for communication to external equipment for configuring the UMD text and tally setup parameters using the TSL protocols discussed in *UMD Text and Tally Control on page 37*.

To set up the 8949SVM in your network, refer to *Networking the 8949SVM on page 23*.

Both models use this connection to upgrade the software on the modules on your network, refer to *Updating Software on page 29*.

Power Up

The front edge LED indicators are illustrated in Figure 5. Upon power-up (installation in a powered up frame), the green PWR LED should light. The red FAULT LED will blink until a valid input signal is applied. With a valid input signal, the green In. Pres LED should be on and the FAULT LED should be off. If not, refer to *Power-Up Diagnostic Failure* on page 35.

The CONF LED flashes when the paddle switch controls are operated. The COMM LED flashes periodically when the Ethernet connection is active (during a software upgrade or UMD control)

Note   The COMM and CONF yellow LEDs indicate local activity on the 8949SVM module only. This module does not currently communicate with the Gecko-Flex frame over the frame serial bus.

Figure 5. Front Edge LEDs Indicators
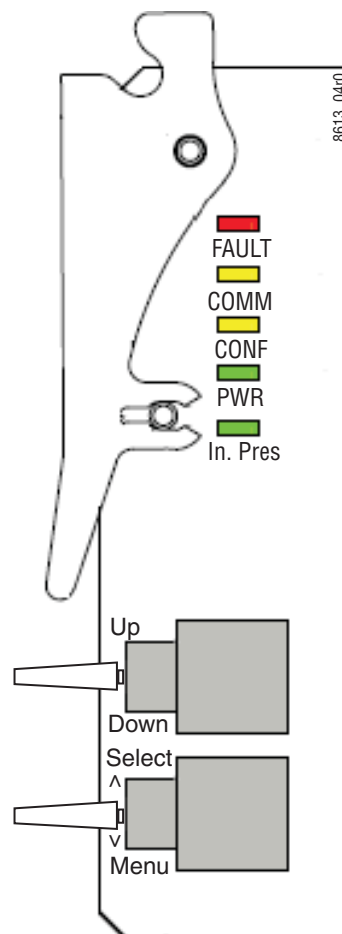
Module Configuration and Monitoring

All configuration for the 8949SVM-LOC and 8949SVM-UMD modules (except for remote UMD text and tally setup) is done using the two paddle switch controls on the front edge of the front module. See *Configuration with Paddle Switch Controls* on page 19.

As these modules do not communicate with the 8900NET (Net Card) module over the frame serial bus, they are only monitored for their presence (gray box) on the frame Status web page (slot 4) as shown in Figure 6.

Figure 6. 8949SVM Presence on Frame Status Web Page

Selecting the link to the module web page will report an empty slot as shown for the module in slot 4 (Figure 7).

Figure 7. 8949SVM Module Web Page

Configuration with Paddle Switch Controls

The front edge paddle switch controls are shown in Figure 8 and described in detail in Table 1 on page 20. Refer also to the *Configuration Example* on page 22.

To use the paddle switch controls for configuring the module, do the following:

1. Press the **Menu** paddle switch control down to enter the local controls. This will bring up the **Status** menu (or the UMD text on the -UMD model) on the bottom of the monitor screen. Use this paddle switch control to select **Status**, the first selection in the top level control groups.

2. Now use the **Up** paddle switch control to scroll through the top level control groups which will appear in this order: **Status (Read-Only)**/**Picture Settings**/**Audio Setup**/**Control Settings**/**Initial Setup**. The different configuration and status menus for each of these groups are described in Table 1 on page 20.

3. When you reach the top level group containing the menus or status items you need, press the **Select** paddle switch control up to enter this group. The menus have abbreviated names as given in the table.

4. Now use the **Up** and **Down** paddle switch controls to scroll through the menu items in this group. When you reach the configuration or status menu you need, press the **Select** paddle switch control up to enter this menu.

5. Now you may use the **Up** and **Down** paddle switch controls to scroll to the configuration parameter desired. Press the **Select** paddle switch control up to accept the setting. Some controls will become active immediately, such as **Pattern**.

6. To set a parameter back to the default value, select the parameter in the display then press the **Down** paddle switch control followed momentarily by the **Menu** paddle switch control. Then release both paddle switch controls.

Figure 8. Front Module Configuration Controls

Up/Down: Once in a top level control group or menu after using Select, use the Up and Down paddle to scroll through control groups or menu choices.

Select: Press paddle up for to enter a top level control group or menu.

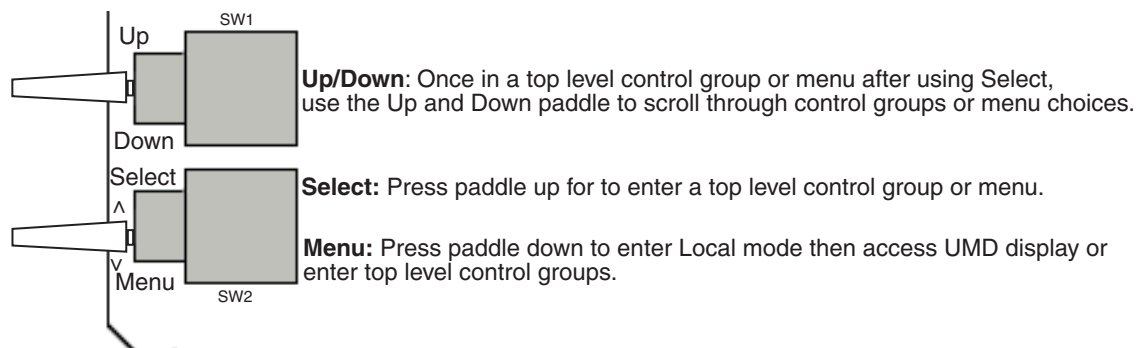**Menu:** Press paddle down to enter Local mode then access UMD display or enter top level control groups.

Table 1. 8949SVM Paddle Switch Configuration Table

Control Group	Control Name	Menu Name/Default	Range/Options	Description
Status (Read-Only)	Input Standard	Input	See Table 2 on page 33	Reports current input standard.
	Audio pairs present	Audio	1 2 3 4 5 6 7 8	Reports audio pairs present in incoming video. No audio pairs will be reported as – –. For example, when only audio pairs 1 and 2 are present, in the input video, the display will read: 1 2 – – – – – –.
	Output Standard	Output	See Table 2 on page 33	Reports current output resolution.
	Product Version	Version	1.0	Reports current software version.
	Current IP address	IP	192.168.0.200 (default)	Displays default or as set by user.
	MAC Address	MAC	XX:XX:XX:XX:XX:XX	Reports unique MAC address for each device.
Picture Settings	Black level	Black level/0mV	-100 to +100mV (in 1 mV steps)	Adjusts black level on monitor.
	Contrast	Contrast/0dB	-6 to +6 dB (in 0.2 dB steps)	Adjusts overall contrast of monitor.
	Colour Saturation	Saturation/0dB	-6 to +6 dB (in 0.2 dB steps)	Adjusts overall color saturation of monitor.
	Luminance gamma	Gamma/1	0.4 to 1.7 (in 0.1 steps)	Adjusts the luminance gamma curve to compensate for monitors with a non-standard gamma response.
	Colour Temperature	Colour Temp/6500K	4000 to 10000 (in 100K steps)	Adjusts overall brightness of monitor.
	Black balance Green	Black bal Green/0mV	-99.2mV to +99.2mV (in 3.2mV steps)	Adjusts black balance of picture components.
	Black balance Blue	Black bal Blue /0mV	-99.2mV to +99.2mV (in 3.2mV steps)	
	Black balance Red	Black bal Red/0mV	-99.2mV to +99.2mV (in 3.2mV steps)	
	White balance Red	White bal Red/0dB	-2 to +2 dB (in 0.1 dB steps)	Adjusts white balance of picture components.
	White balance Green	White bal Green/0dB	-2 to +2 dB (in 0.1 dB steps)	
	White balance Blue	White bal Blue/0dB	-2 to +2 dB (in 0.1 dB steps)	
Audio Setup	De-embedder group	De-embedder group/1	1 to 4	Select which audio group from available audio pairs to de-embed and output as analog. See Status control group for Audio Pairs Present.
	Audio Delay	Audio Delay/0ms	-30ms to +170ms	Adjusts the amount of audio delay relative to the video processing delay within the module. Add delay as necessary to compensate for video delays in the display device.
	Audio Delay Enable	Delay/Enabled	Enabled or Disabled	Enable or disable audio delay.
	Line output pair	Line output pair/1	1, 2	Select Pair 1 or Pair 2 of the de-embedded audio group as the output.
	Line output level	Line output level/+18dBu	+12 to +24dBu	Adjusts output level of line output pairs.
	Line combine	Line combine/Off	Off, Pair, Combine	Selecting Pair sums channels 1 and 3 of de-embed group and outputs on left analog channel. Adds channels 2 and 4 of de-embed group and outputs on right analog channel. Gain reduced by 6dB. Selecting Combine sums all four channels of de-embed groups and outputs on both left and right analog channels. Gain reduced by 12dB.

Table 1. 8949SVM Paddle Switch Configuration Table

Control Group	Control Name	Menu Name/Default	Range/Options	Description
Control Settings	Pattern	Pattern/Off	Off, Bars, Pluge, Pluge M	Select Off or one of three test patterns.
	Safe area markers	Safe area/Off	Off, 16:9, Protect 4:3	Select Off or safe area markers on monitor.
	UMD select	UMD Select/Disable	Enabled or Disabled	8949SVM-UMD only. See *UMD Text and Tally Control* on page 37.
	Auto image width	Auto width/Enabled	Enabled or Disabled	Image width is adjusted automatically.
	Manual image width	Manual width/100	50 to 120 (in steps of 1)	Adjust width of image manually.
	Anamorphic SD	Anamorphic/Disabled	Enabled or Disabled	When enabled, compensates for 16:9 SD images transmitted in the anamorphic format.
	Pulse cross	Pulse cross/Disabled	Enabled or Disabled	Enabled shows horizontal and vertical blanking view.
	Tally left	Tally left/Off	Off, Red Green	8949SVM-UMD only. See *UMD Text and Tally Control* on page 37.
	Tally right	Tally right/Off	Off, Red, Green	
Initial Settings	Display Size	Size (HxV)/Auto	Refer to Table 2 on page 33.	When set to Auto, optimum monitor resolution will be auto-sensed. User can select resolutions below optimum. When attempts to select resolution above optimum, monitor will report: Cannot display this mode and switch to optimum resolution.
	Frame rate	Frame/Follow input 60Hz	Follow Input 60 Hz, Follow Input, Monitor rate	Select output frame rate as one of three choices: Follow Input 60Hz: Output will always be 59.94 or 60Hz and will phase lock to the input frame rate if possible. 50Hz inputs will be converted to 60Hz prior to display. Follow Input: Output will be 50Hz for 50/25Hz inputs and 60/59.94Hz for the corresponding inputs. Output will frame lock to input if possible. Refer to Table 3 on page 34 for delay lengths relative to input format. Monitor rate: This mode uses more information from the display device and should be used if the above modes do not give a correctly positioned image.
	Display drive	Display drive/DVI	DVI or RGB	Refer to *DVI-I Connector* on page 14 for cabling descriptions and using DVI or VGA monitor.
	Power save	Power save/Disabled	Enabled or Disabled	When enabled, if no SDI input is detected for 5 seconds, the unit will disable the DVI output causing the display to enter a power saver state.
	DHCP	DHCP/Disabled	Enabled or Disabled	Refer to *UMD Text and Tally Control* on page 37 for networking details.
	IP net mask	IP net mask/255:255:255:0	(text edit)	
	Default IP address	Default/192.168. 0.200	(text edit)	
	Default gateway	Gate/192.168. 0. 1	(text edit)	
	IP multicast	Mult/232.2. 3. 2	(text edit)	Refer to *UMD Text and Tally Control* on page 37 for using multicast functions.
	ID multicast	ID multicast/0	0 to 126	
	Unit reset	Restart	–	Reset unit, user settings remain as programmed.

Configuration Example

A general example of using the paddle switch controls is given here.

Set Safe Area Markers

To set the **Safe Area Markers** in the **Control Settings** control group do the following:

1. Press the **Menu** paddle switch control down until you reach the **Status** control group.

2. Use the **Up** or **Down** paddle switch control to scroll to the **Control Settings** control group.

3. When you reach this group, press the **Select** paddle switch control up to enter it. The display will show the **Pattern** selection, the first control in this group.

4. Now use the **Up** or **Down** paddle switch controls to scroll to the **Safe area markers** control. When you reach this control, press the **Select** paddle switch control up to enter the menu.

5. Once in the menu, the name of the menu will be displayed along with the currently selected parameter. Use the **Up** or **Down** paddle switch controls to scroll through the parameter choices in this menu as given in Table 1 on page 20.

6. Leave the selection on the parameter you want and press the **Select** paddle switch control up to enter it.

7. Press the **Menu** paddle switch control down to return to the control groups.

Networking the 8949SVM

The 8949SVM-UMD and 8949SVM-LOC modules must be connected via the rear Ethernet connection to a local or networked PC for upgrading software. Refer to *Updating Software* on page 29.

The 8949SVM-UMD can also be connected to external equipment via the Ethernet port for setting the UMD text and controlling the tallies. Refer to *UMD Text and Tally Control* on page 37.

The unit can connect directly to a PC or laptop (one-to-one) or via a network. The network address assignment may be done by DHCP or static IP address assignment (non-DHCP). This selection is made in local configuration in the Initial Settings control group as described in Table 1 on page 21 and described in *Set Default IP, IP Net Mask and Default Gateway*.

Determine the type of network connection you will use, then refer to one of the following:

- Set Default IP, IP Net Mask and Default Gateway (page 24)
- Direct Connection to a PC or Laptop (page 25)
- Access Through a Non-DHCP Network (page 27)
- Access Through a DHCP Enabled Network (page 28)
- Forcing a Default IP Address (page 28)

Note   These instructions reflect the use of a PC running the Windows XP OS.

You will need to determine if the Default IP, Net Mask, and Default Gateway addresses need to be changed from the default settings on the module. The default values set on the module are listed in Table 1 on page 20. Use the instructions given in *Set Default IP, IP Net Mask and Default Gateway* on page 24 and/or refer to *Module Configuration and Monitoring* on page 18 for changing the network addresses and using the paddle switch controls.

Set Default IP, IP Net Mask and Default Gateway

Change any of the network addresses if required as described below. This example will show how to change the **Default IP address** from 192.168. 0.200 to 10. 16. 18. 59. The other network addresses are changed in the same manner.

1. Press the **Menu** paddle switch control down until you reach the **Status** control group.

2. Use the **Up** or **Down** paddle switch controls to scroll to the **Initial Settings** control group.

3. When you reach this group, press the **Select** paddle switch control up to enter the menu group. The **Display Size** menu is the first selection.

4. Now use the **Up** or **Down** paddle switch controls to scroll to the **Default IP Address** menu and enter this menu by pressing the **Select** paddle switch control up.

5. In the **Default IP address** menu, the first set of numbers in the Default IP address menu will be surrounded by brackets (<192>168. 0.200) indicating they can be changed (from 0 to 255) using the **Up** and **Down** paddle switch controls.

6. Make the required change to the first set of numbers and when finished, press the **Select** paddle switch control up. This will enter the new values and move the brackets to the next set of numbers (10<168> 0.200) indicating these may now be changed.

7. Set the second set of numbers using the **Up** and **Down** paddle switch controls and when finished, press the **Select** paddle switch control up to enter these numbers and move to the next set (10.16< 0>.200).

8. Do the same for the third set of numbers and press the paddle switch control up to enter this value and move to the last set (10.16.18<200>).

9. Once you have set the last set of numbers and the display reads 10. 16. 18. 59, press the **Select** paddle switch control up to enter this address into the module.

10. Now, press the **Menu** paddle switch control down to leave the **Default IP address** menu.

Direct Connection to a PC or Laptop

1. Connect the unit to the network port of the PC or laptop using a cross-wired RJ-45 Ethernet cable.

2. From the **Start** button on your PC and go to Settings/Network Connections and click on the **Local Area Connection** icon. If several local connections are shown, ensure that the one corresponding to the port the unit is connected to is selected.

3. In the Local Area Connections Status, **General** tab, select the **Properties** button.

4. This will bring up the Local Area Connections Properties page (Figure 9). In the items listed under **This connection uses the following items:**, select **Internet Protocol (TCP/IP)**.

5. In the **General** tab, select the **Properties** button for the Internet Protocol (TCP/IP) to bring up the Internet Protocol (TCP/IP) Properties page (Figure 10 on page 26).

Figure 9. Local Area Connection Properties
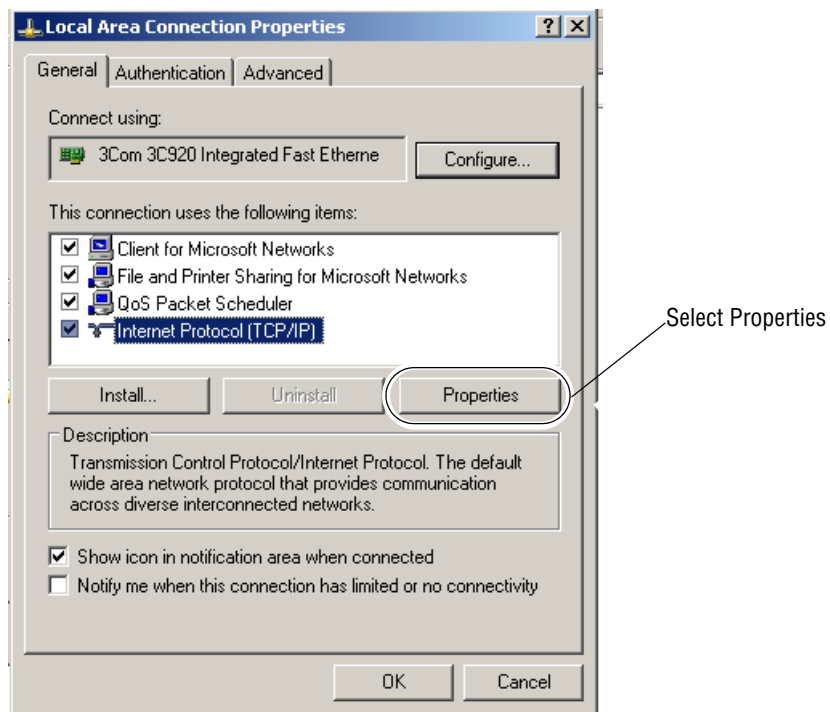
Figure 10. Internet Protocol (TCP/IP) Properties
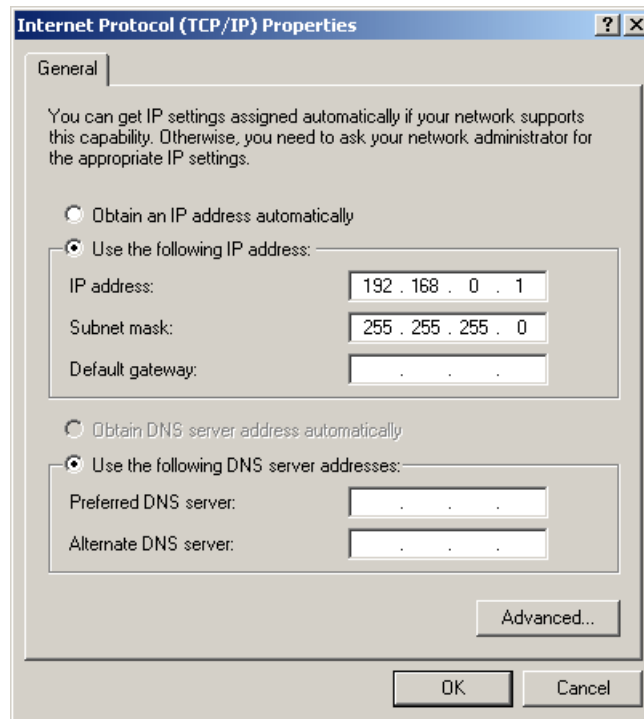
6. On the Internet Protocol Properties page, select the **Use the following IP Address** radio button to allow an IP address and Subnet mask to be entered (Figure 11 on page 27).

7. Enter the default IP Address and Subnet mask to put the PC on the same local network as the 8949SVM module. This example will use the default IP, Net Mask, and Gateway addresses on the module.

- IP address: 192.168. 0.200

- Subnet mask: 255.255.255.0

- Default Gateway: 192.168. 0. 1

Figure 11. Enter IP Address and Subnet Mask
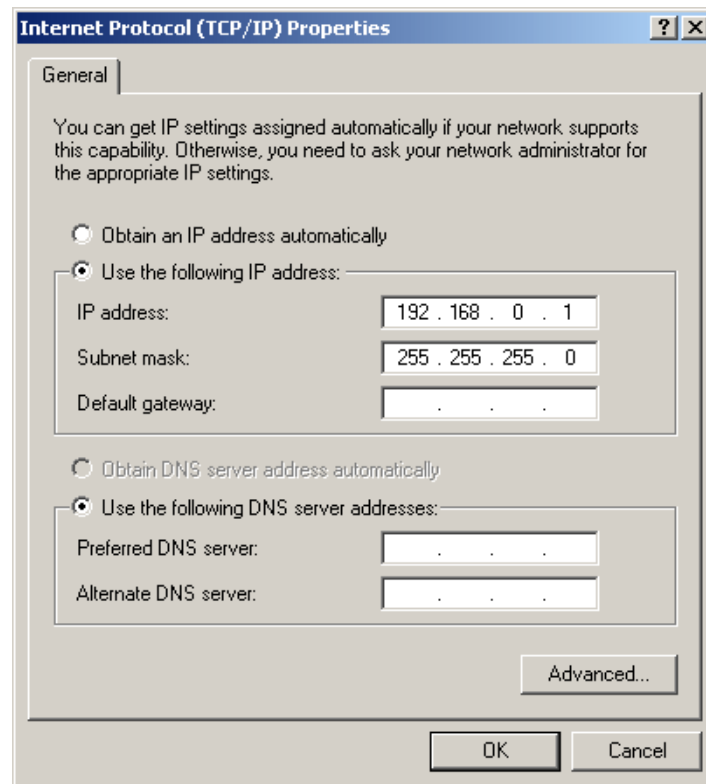
8. This will now allow communication between the PC and the module for updating software. Refer to *Updating Software* on page 29.

Access Through a Non-DHCP Network

1. Connect the unit to a network hub or switch using a standard (not cross-wired) RJ-45 Ethernet cable.

2. Determine the correct IP address and subnet mask from your Network Administrator.

3. If you need to change your IP address and/or subnet mask, use the paddle switch controls to enter the correct values in the Initial Settings control group as summarized in Table 1 on page 20 and described in step by step detail in *Set Default IP, IP Net Mask and Default Gateway* on page 24.

4. When the IP address setup is complete, go directly to *Updating Software* on page 29.

Access Through a DHCP Enabled Network

1. Enable the DHCP mode with the paddle switch controls and restart the board by selecting the Unit reset with the paddle switch controls.

2. Connect the module to a network hub or switch using a standard RJ-45 Ethernet cable.

3. The unit will be assigned an IP address by the DHCP server.

4. To locate this address, scroll to the **Status** control group using the paddle switch controls then enter the **Status** control group by pressing the Menu paddle switch control up. Use the **Up** and **Down** paddle switch controls to scroll to the **Current IP address** and note what IP address the unit has been assigned by the DHCP server.

5. When the IP address setup is complete, go directly to *Updating Software on page 29*.

Forcing a Default IP Address

1. Disable the DHCP mode using the paddle switch controls and restart the board by selecting the Unit reset with the paddle switch controls.

2. The default IP address can be forced to the module by using the paddle switch controls as described in Table 1 on page 20 and described in step by step detail in *Set Default IP, IP Net Mask and Default Gateway on page 24*.

3. The current IP address can be checked by selecting the Status control group and scrolling through the values with the paddle switch controls.

4. When the IP address setup is complete, go directly to *Updating Software on page 29*.

Updating Software

Updating 8949SVM software requires a file named 8949SVM-LOC_1.0 or 8949SVM-UMD_1.0, depending on the module type you are updating. These files will be available on the Thomson Grass Valley ftp site when software updates are released. Refer to *Contacting Grass Valley on page 4*.

To install a software update do the following:

1. Connect to the 8949SVM via the Ethernet with your PC (see *Networking the 8949SVM on page 23*).

2. Place the file(s) for the specific software update(s) on your PC desktop.

3. Double click on the 8949SVM-LOC_1.0 or 8949SVM-UMD_1.0 file to run the application as shown in Figure 12.

4. All the 8949SVM devices on the same LAN will be identified by MAC address using query on IP Multicast.

5. Select the 8949SVM device in the list you wish to upgrade. This illustration shows only one module on the network. Once the application recognizes the device, it will fill in the Product Name (8949SVM-UMD), Product Version currently loaded (x0.8c), and the upgrade version it is loading (x1.0).

Note   If the unit is missing in the upgrader list, check that the IP Multicast of the module is set to 232. 2. 3. 2. If not, set it to this address.

Figure 12. 8949SVM Upgrader Application
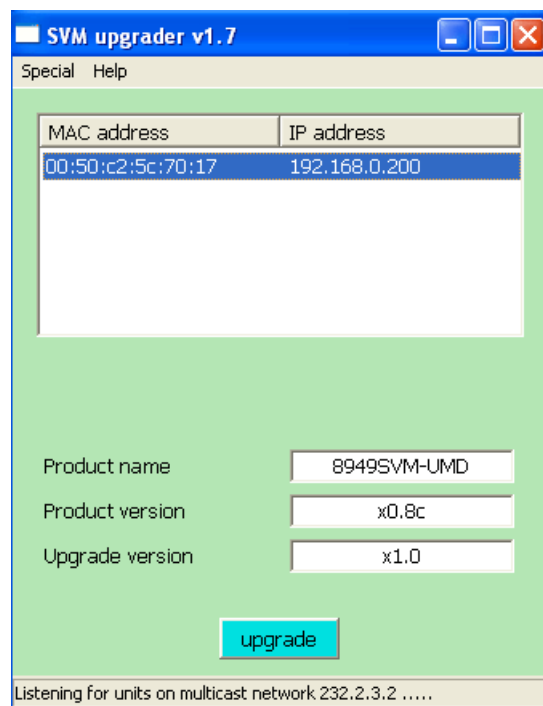
**6.** If the device is already at this new version of software, a message similar to the one shown in Figure 13 will be displayed.

Figure 13. No Upgrade Required
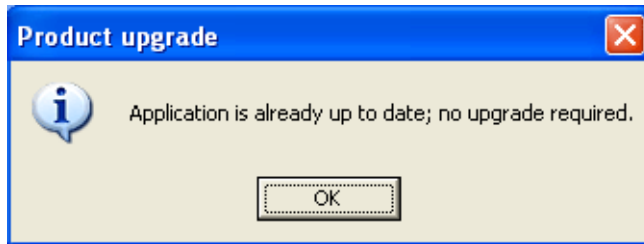
7. If the new software upgrade is needed, select the **upgrade** button at the bottom of the screen shown in Figure 12 on page 29.

8. This will begin the upgrade and a Downloading screen will show the progress of the update (Figure 14).

Figure 14. Upgrade in Progress
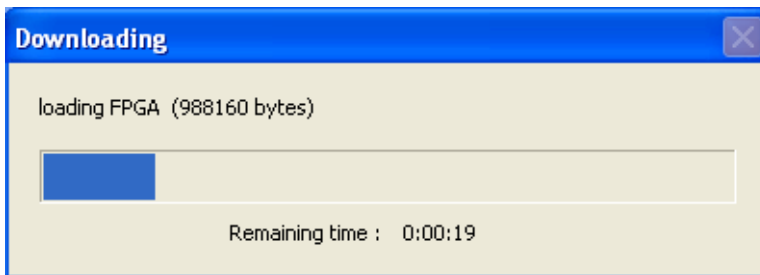
9. Once the upgrade has finished, the screen shown in Figure 15 will be displayed.

Figure 15. Upgrade Successful
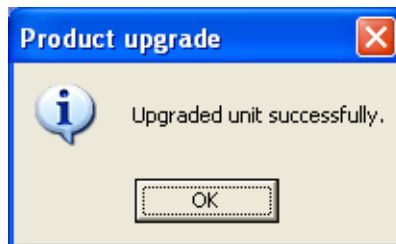
10. Check the Upgrader main screen again to verify that the software has been upgraded to the correct version (Figure 16).

11. This completes the software update. Refer to any Release Notes that are included with the update for new functionality and other release information.

Note The module will retain the current configuration made before the software update. If you would like to restore defaults, use the Set defaults selection in the Special pulldown menu. Refer to *Special Menu Pulldown* on page 32.

Figure 16. Check Software Version
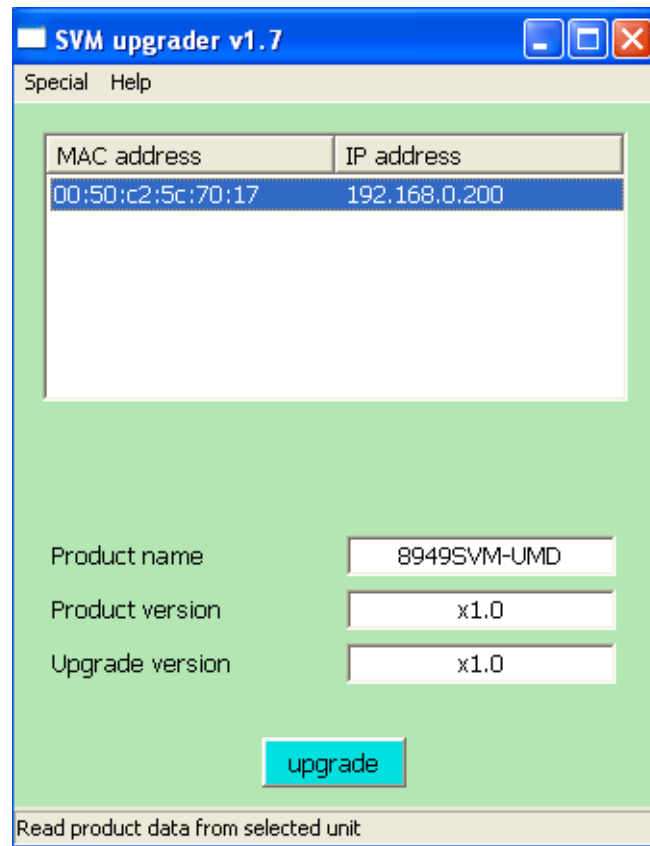
Special Menu Pulldown

The upgrader application has a **Special** menu pulldown as shown in Figure 17.

The following functions can be performed in this menu pulldown:

- **Recover unresponsive unit** – select this function if the upgrade process had previously failed to complete (for example due to power failure during upgrade) or if the 8949SVM fails to operate correctly. Follow the instructions in the pop-up boxes.

- **Change output log file** – During the upgrade process, the 8949SVM will create a log file detailing the completed stages of the upgrade. Select this menu option to change the file location or name. The default is C:\Upgrader_temp\upgrader_log.txt.

- **Set defaults** – sets all parameters of the connected 8949SVM to the factory default state (default parameter values are listed in Table 1 on page 20)

- **Show defaults** – lists the factory default values for all parameters.

- **Show run-time log of unit** – Read an area of memory in the connected 8949SVM which may contain information relating to problems in operation. Used only for factory debug.

Figure 17. Special Menu Pulldown
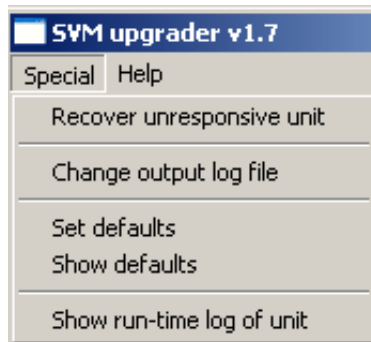
Specifications

Refer to Table 2 for 8949SVM module specifications.

Table 2. 8949SVM Specifications

Parameter	Value
Video Inputs	
HD/SD-SDI	Auto-sensing or user-selection of the following SDI video standards:
SD standards	525 @ 59.94Hz 625 @ 50 Hz (Selection of anamorphic SD must be set by the user)
HD standards	720p @ 60Hz, 59.94Hz, 50Hz, 30Hz, 29.97Hz, 25Hz, 24Hz, 23.98Hz 1080i @ 60Hz, 59.94Hz, 50Hz 1080p @ 30Hz, 29.97Hz, 25Hz, 24Hz, 23.98Hz 1080sf @ 24Hz
Equalization	Up to 125m (HD-SDI on Belden 1694A cable) Up to 330m (SD-SDI on Belden 1694A cable)
Video Outputs	
DVI-I	With digital and analog (VGA type) signals Maximum cable length 15m (dependent on cable and display resolution)
HD/SD-SDI	2 BNCs equalized copy of input feed (not reclocked)
Analog Audio	
Outputs	2 Channels, balanced (maximum level of +24 dBu) Output pair user-selected from up to four audio pairs
Output level error	<0.8dB @ 1kHz
Left/Right gain error	<0.02dB @ 1kHz
THD	<-85dB @ 700Hz, +23dBu <-95dB @ 700Hz, +18dBu
L/R crosstalk	<-78dB @ 10kHz, +24dBu
Supported Output Resolutions	
5:4	1280 x 1024
4:3	1024 x 768 1400 x 1050 1600 x 1200
16:10	1280 x 800 1440 x 900 1680 x 1050 1920 x 1200
16:9	1366 x 768 1920 x 1080
Other	1280 x 768
Frame Rate Conversion[1]	
Input Frame Rates	Output Frame Rates
23.98Hz	60Hz (temporal conversion)
50Hz	50 Hz and 60Hz (temporal conversion)
59.94Hz	59.94Hz
On-screen Display[2]	
Tallies	2 (red and green)
UMD text	Up to 16 characters with extended character set

Table 2. 8949SVM Specifications

Parameter	Value
Compatible frame type	GeckoFlex 8900FF/8900FFN (with fans) (8900NET or Frame Monitor module not required for operation)
Power	8.5W (single slot)[3]

[1] Output modes are only available where supported by the monitor. 60Hz computer scan rates are often close but not exactly equal to 60Hz. The 8949SVM adjusts line and vertical blanking to provide a 60Hz scan rate.

[2] As the 8949SVM module does not communicate with the 8900NET (Net Card) module over the frame serial bus, the configuration of tallies and UMD text on the 8949SVM-UMD module must be done by connecting an external system supporting TSL protocol to the module's Ethernet port. See *UMD Text and Tally Control* on page 37.

[3] When used in a frame with an 8900NET (Net Card) module, the Power Supply/Demand web page will report 5.5 Watts for any slot with an 8949SVM module installed. The 8949SVM does not communicate with the 8900NET module over the frame serial bus so the 8900NET assumes a default power demand of 5.5 Watts.

Table 3 gives the approximate amount of delay length relative to the input format when the module Frame Rate control is set for **Follow Input** mode in the Initial Settings control group.

Table 3. Delay Length Relative to Input Format

Frame Rate	Delay Length
625i/PAL	41ms
525i/NTSC	34ms
720p/23.98	84ms
720p/24	84ms
720p/25	81ms
720p/29.97	67ms
720p/30	67ms
720p/50	41ms
720p/59.94	34ms
720p/60	34ms
1080p/23.98	84ms
1080p/24	84ms
1080p/25	81ms
1080p/29.97	67ms
1080p/30	67ms
1080i/50	41ms
1080i/59.94	34ms
1080i/60	34ms
1080sf/23.98	43ms
1080sf/24	43ms

Service

The 8949SVM modules make extensive use of surface-mount technology and programmed parts to achieve compact size and adherence to demanding technical specifications. Circuit boards should not be serviced in the field unless directed otherwise by Customer Service.

Power-Up Diagnostic Failure

If the module has not passed self-diagnostics and the FAULT LED remains on after a valid signal is applied, do not attempt to troubleshoot. Return the unit to Grass Valley. See *Module Repair* below.

Troubleshooting

Electronic Circuit Breaker

An electronic circuit breaker on the module works during a fault condition or an overcurrent to cut off power to the module in place of a fuse.

If power has been cut off to module, remove the module and replace it in the frame to reset. If the problem persists contact Grass Valley Customer Service.

Module Repair

If the module is still not operating correctly, replace it with a known good spare and return the faulty module to a designated Grass Valley repair depot. Call your Grass Valley Customer Service representative for depot locations.

Refer to *Contacting Grass Valley on page 4* at the front of this document for the Grass Valley Customer Service contact information.

Functional Description

Figure 18 illustrates a block diagram of the 8949SVM-LOC and 8949SVM-UMD modules.

Figure 18. 8949SVM Block Diagram
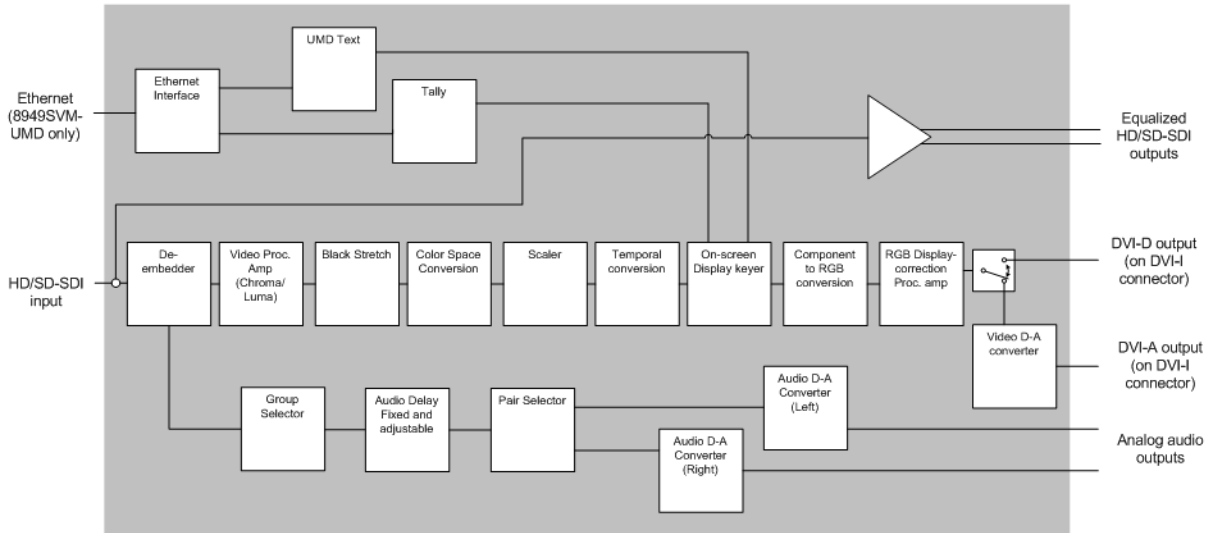
UMD Text and Tally Control

Introduction

The current protocol available for setting the UMD text and the tally controls on the 8949SVM-UMD module are compatible with the TSL (Television Systems Limited) protocol version 3.1 and version 4.0. The module will recognize the correct protocol based on the packet length.

Packets are carried by UDP/IP. Each unit must have a unique IP address, set by paddle switch controls and listen on port 81. Units also listen on a multicast address which is set by a further menu control also on port 81. The Unit ID is set through the paddle switch control system. See Table 1 on page 20 for setting addresses.

The description of version 3.1 is given in *TSL Protocol Version 3.1* on page 38.

The description of version 4.0 is given in *TSL Protocol Version 4.0* on page 39.

Tally Control

Tally control is available to place on-screen tally indicators on the monitor display for reporting video status. Three tally states (Red, Green, or Off) can be displayed.

UMD Text

UMD text can be up to 16 characters using the standard ASCII character set and the extended character set described below.

Extended Character Set

The following extended characters can be used in addition to the standard ASCII set for defining UMD text:

Ç ü é â ä à ç ê ë è ï î ì æ Æ ô ö ò û ù á Í ó ú ñ ¿ ã ß õ µ €

TSL Protocol Version 3.1

The following section describes TSL protocol version 3.1 in Table 4 and Table 5.

Table 4. Version 3.1 Byte Offsets and Functions

Byte Offset	Function
0	Unit ID
1	Tally Control
2-17	UMD Text

Table 5. 3.1 Protocol Description

Unit ID	Unit Level Addressing for Multicast Data	
(Bit 7)	Must be 1	
(Bit 6..0)	Unit addresses are in range 0...126. The value of 127 is taken to address all units (to which the packets are delivered). Unit address is controlled by the Multicast ID set through the paddle switch controls.	
Tally Control		
(Bit 7)	Must be 0	
(Bit 6)	Must be 0	
(Bit 5..4)	Not used	
(Bit 3)	Tally 4	Selecting both Tally 3 and Tally 4 is undefined behavior
(Bit 2)	Tally 3	
(Bit 1)	Tally 2	Selecting both Tally 1 and Tally 2 is undefined behavior
(Bit 0)	Tally 1	
Tallies are mapped as follows:		
	Tally 4	Right Green	0: Off; 1: On
	Tally 3	Right Red	0: Off; 1: On
	Tally 2	Left Green	0: Off; 1: On
	Tally 1	Left Red	0: Off; 1: On
UMD Text	16 characters	
UMD text characters includes the standard ASCII character set along with an Extended Character set described in *Extended Character Set* on page 37.		

TSL Protocol Version 4.0

The following section describes TSL protocol version 4.0 in Table 6 and Table 7.

Table 6. Version 4.0 Byte Offsets and Functions

Byte Offset	Function
0	Unit ID
1	Tally Control
2-17	UMD Text
18	Checksum
19	VBC
20	XBYTE1
21	XBYTE2

Table 7. 4.0 Protocol Description

Unit ID	Unit Level Addressing for Multicast Data
(Bit 7)	Must be 1
(Bit 6..0)	Unit addresses are in range 0...126. The value of 127 is taken to address all units (to which the packets are delivered). Unit address is controlled by the Multicast ID set through the paddle switch controls.
Tally Control	
(Bit 7)	Must be 0
(Bit 6)	Must be 0
(Bit 5..4)	Not Used
(Bit 3..2)	Not Used
(Bit 1..0)	Not Used
UMD Text	16 Characters
UMD text characters includes the standard ASCII character set along with an Extended Character set described in *Extended Character Set* on page 37.	
Checksum	Ignored
VBC	Must be 0x02 interpreted as minor Version 0, extra data length 2
XBYTE1	
(Bit 7)	Must be 0
(Bit 6)	Must be 0
(Bit 5)	Left Hand Tally MSB
(Bit 4)	Left Hand Tally LSB
(Bit 3..2)	Ignored
(Bit 1)	Right Hand Tally MSB
(Bit 0)	Right Hand Tally LSB
Note: 2-bit Tally values are used as follows: 0: Off; 1: Red; 2: Green; 3: Off	
XBYTE2	Ignored

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